

# **MESTRADO**

## **ECONOMIA INTERNACIONAL E ESTUDOS EUROPEUS**

### **TRABALHO FINAL DE MESTRADO**

#### **DISSERTAÇÃO**

**IMPACTO DA FACILITAÇÃO DO COMÉRCIO AO LONGO  
DO "BELT AND ROAD" NAS EXPORTAÇÕES CHINESAS**

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THE INFLUENCE OF TRADE FACILITATION ALONG THE  
“BELT AND ROAD” ON CHINA’S EXPORT

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## Resumo

Com o ritmo da integração económica, o desenvolvimento de padrões comerciais entre os países também se torna mais complexo. Desde a crise financeira de 2008, o protecionismo comercial aumentou, a recuperação económica está lenta, novos desafios continuam a surgir. Neste contexto, a China, mantendo a tendência de desenvolvimento dos tempos, apresentou a iniciativa "Belt and Road" em 2013, visando tornar-se outra "Rota da Seda" no novo século como um elo entre a Ásia e a Europa em que os países ao longo do percurso possam estabelecer uma comunicação mais profunda no comércio, e mesmo em termos culturais e políticos. A facilitação do comércio desempenha, sem dúvida, um papel importante, porque tem a ver com o grau de barreiras comerciais entre países, a construção de infra-estrutura, abertura económica e outros aspetos das relações económicas entre países.

Neste sentido, a fim de estudar o papel da facilitação do comércio em maior profundidade e apresentar propostas práticas para promover o comércio de exportação da China para os países "Belt and Road", nesta dissertação constrói-se o correspondente sistema de índice de facilitação do comércio e um modelo gravitacional do comércio, baseado nas características da região, e calcula-se o nível de facilitação do comércio em 50 países ao longo do percurso em 2013-2017, compilado, em seguida, em dados de painel e realiza-se a análise de regressão nos níveis, geral, regional e fatorial. A partir dos resultados, podemos ver que o nível de facilitação do comércio dos países é desigual e tem uma relação positiva com o comércio de exportação da China. No final, as recomendações políticas relevantes são apresentadas, considerando que os países devem melhorar o nível de facilitação comercial, nos seus próprios aspectos e nos aspectos gerais, fortalecer a construção de infra-estruturas, estabelecer uma gestão aduaneira mais padronizada e promover ativamente a construção de zonas de livre comércio e a assinatura de acordos de livre comércio.

Palavras-chave: Facilitação do comércio, Belt and Road, Exportação

## Abstract

With the pace of economic integration, the development of trade patterns between countries is also more complex. Since the financial crisis in 2008, trade protectionism has risen, economic recovery is slow, new challenges continue to emerge. In this context, China, in keeping with the trend of development of the times, put forward the "Belt and Road" initiative in 2013, committed to becoming another "Silk Road" in the new century as a link between Asia and Europe, so that countries along the route obtain a deeper communication in trade, and even in cultural and political aspects. In the process of "Belt and Road" development, trade facilitation undoubtedly plays an important role, because it relates to the degree of trade barriers between countries, infrastructure construction and economic openness and so on. For the trade side, improve the level of trade facilitation can better achieve the goal of win-win situation.

Therefore, in order to study the role of trade facilitation in greater depth and put forward practical proposals to promote China's exports trade to the "Belt and Road" countries, this dissertation constructs the corresponding trade facilitation index system and trade gravity model based on the "Belt and Road" regional characteristics and calculates the level of trade facilitation in 50 countries along the route in 2013-2017, then compiled into panel data and carries out the regression analysis at the overall, regional and factor levels. From the results, we can see that the level of trade facilitation of countries is uneven and has a positive relationship with China's export trade. At the end, the relevant policy recommendations are given considering that countries should improve the level of trade facilitation from their own and overall aspects, strengthen infrastructure construction, establish more standardized customs management, and actively promote the construction of free trade zones and the signing of free trade agreements.

**Key Words:** Trade facilitation, Belt and Road, Export trade

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## **1. Introduction**

### ***1.1 Research background***

As the pace of economic globalization continues to develop, the links between countries in the world are becoming more and more close; but at the same time, due to the trend of global integration, since the outbreak of the global economic crisis in 2008, the international finance has been hit hard and the economy has recovered slowly, the economic trade between countries is also showing a deceleration.

All countries and economies around the world are actively seeking solutions to promote the development of their own economies, therefore, various regions of the world have emerged with bilateral and multilateral corresponding economic cooperation mechanisms, such as the Transatlantic Trade and Investment Partnership (TTIP), the Trans-Pacific Partnership (TPP), and the East Asia 10+3 mechanism. It is gradually progressing in the direction of regional economic integration. In this context, President Xi Jinping proposed in Kazakhstan on September 7, 2013 to jointly build the "Silk Road Economic Belt" initiative to build a mutually beneficial community of interests, and on October 3 of the same year, in Indonesia he put forward a new initiative to build the "Silk Road Economic Belt" and the "21st century Maritime Silk Road" and have comprehensively structured an open platform for the all-round liberalization of the "Belt and Road" to accelerate the resolution of obstacles to trade facilitation.

According to the World Development Indicators (WDI, 2016), countries along the route involve a total population of about 3.21 billion, accounting for 43.4% of the world's population, with 29% of total economy of the world and 21.7% of the world's total trade. The development trend of countries along the route has continued to rise in recent years, with GDP reaching even \$12 trillion in 2016, accounting for about 16% of the total global GDP; the growth rate of foreign trade along the countries of the route is also increasing year by year, and the exports of countries along the route are expected to account for 1/3 of total world exports over the next 10 years (Jia et al., 2017). In 2017, China and the B&R countries achieved relatively rapid growth in total imports and exports which reached \$1.44032 trillion, higher than China's overall foreign trade



growth rate of 5.9%, accounting for 36.2% of China's total import and export trade. For the first time, the rate of growth in imports outpaced exports, with exports up to 8.5% and imports up to 19.8% (National Information Centre, 2018).

However, the large differences in resource endowments, poor infrastructure and inadequate economic systems in the countries along the route have forced countries to begin to seek measures to improve trade facilitation in order to expand their trade with other countries. For enriching and perfecting the connotation of "Belt and Road", promoting and speeding up the construction of it, raising the level of national economic development, and promoting the improvement of the economic level of the countries along the route, all of which have a very important realistic role and significance.

This paper analyzes the current situation of "Belt and Road" trade and the measurement of trade facilitation in the region, not only help the region along the route to improve their trade facilitation, but also contribute to a comprehensive understanding of the economic and trade situation along the region. The empirical test part of this paper accurately gives the "Belt and Road" the specific value of the impact of trade facilitation on China's export trade in different regions which will help China to expand bilateral trade according to the specific situation of each region along the route. Therefore, the study will learn more about the current state and future direction of trade between China and countries along the route. And this paper will also put forward feasible policy suggestions on this basis.

### ***1.2 Research content***

This thesis studies the impact of "Belt and Road" initiative's trade facilitation on China's export trade. Mainly solves three aspects of the problem:

- 1) What is the level of trade facilitation in the countries of the "Belt and Road" region?
- 2) Do the indicators in the trade facilitation indicator system have an impact on China's export trade?

- 3) Will the increase in the level of trade facilitation have an impact on the increased export trade of countries along the "Belt and Road?"

In order to solve these problems, the research in this paper is divided into the following six chapters, the specific contents are as follows.

The First chapter is the introduction part, mainly elaborated the whole article that carries on the topic selection background and the significance, as well as expounds the methods and calculation used in the research.

The Second chapter is the theoretical basis and the important definition part;

The Third Chapter carries out a statistical analysis of the overall trade situation of the countries along the "Belt and Road".

The Fourth chapter shows overview of the "Belt and Road" initiative and the trade facilitation, as well as indicating the status quo of trade facilitation level of B&R countries.

The Fifth chapter is the empirical analysis part, mainly through the gravity model analysis the impact of the trade facilitation level on China's export trade by multi-aspects.

The last chapter is the research conclusion and the policy suggestion part, mainly states the results after the empirical analysis of the research.

### ***1.3 Research methods***

First, literature and data analysis methods. Through the collection and collation of a large number of relevant theoretical and textual materials and select some of the important theoretical knowledge and research results to produce a macroscopic understanding of trade facilitation and to reveal the crucial importance of trade facilitation; for this article, to provide a theoretical basis. By collecting relevant official data, people can have a concrete understanding of the current trade situation in the "Belt and Road" region for nearly 10 years, thus further demonstrating the importance of this study.

Secondly, comparative analysis method of qualitative and quantitative combination. Through the construction of trade gravity model, to compare the trade facilitation indicators of various countries along the route by statistics and to analyze scientifically the "Belt and Road" trade facilitation level, then explore its impact on China's export trade.

Third, the empirical analysis method. The trade gravity model constructed in this paper is an extension of the traditional model, including the country's GDP, the distance between countries, and so on, in addition to the population and other variables into the model to study.

#### ***1.4 Research significance***

Through the existing international research on trade facilitation data, it is found that there are two shortcomings: first, there is no uniform standard of interpretation for trade facilitation; Second, the previous studies of trade facilitation Index system, mainly use countries in a global level or international cooperation organizations as the object of study, rarely focus on "Belt and road" countries, so the data is not complete. This paper summarizes the previous scholars' research on trade facilitation, combined with the current trade situation, through the construction of trade gravity model, to find out the impact of trade facilitation on export trade, and put forward targeted suggestions, for the "Belt and Road" region to take different effective economic measures having a theoretical and practical significance. In addition, this paper divides the area along the route into three parts to measure the level of trade facilitation, which makes the analysis multi-angle; there are also innovations in the selection of trade gravitational model variables.

In the study of trade facilitation, we will, to a certain extent, find the influencing factors that hinder bilateral and multilateral trade development, so that we can improve and solve the existing problems, promote the development of trade and promote economic growth.

## **2. Theoretical basis and literature review**

### ***2.1 Basic definition of relevant concepts***

#### ***2.1.1 Meaning of trade facilitation***

The World Trade Organization (WTO, 1998) defines trade facilitation as “the simplification and harmonization of the transmission of data on the movement of goods, the conduct, practices and procedures involved in the process of dealing with the needs of international trade.” The essence of trade facilitation is to strengthen the trade and information mobility among countries by eliminating the barriers in trade which include the improvement of convenience in transportation, reduction of costs of import and export and simplification of procedures, etc. Its fundamental purpose is to create an orderly and transparent trading system and environment and to promote trade development between countries or economic entities by regulating trade procedures and harmonizing agreements related to trade facilitation.

International trade has a long history, so there is a large number of theories, more or less, those scholars and investigators mostly have given a positive attitude to the promotion brought by trade facilitation.

#### ***2.1.2. Meaning of regional economic integration***

The term "regional economic integration" first appeared in Western Europe, but the definition of the term has never been uniformed. EL-Agraa (1988) argues that regional economic integration is a process of continuous integration of different economies, followed by the formation of a large international organization in which trade barriers are gradually removed and the goods of countries will be more freely circulated. This is similar to the exposition of American economist Bela Balassa (1961) in *Theory of Economic Integration*, but Balassa's explanation is more comprehensive, and she divides it into two stages: a process and a state. This definition of Balassa was very classic that expressed the most essential connotation of regional integration and won the general recognition of the Western economic circles, the subsequent scholars on this issue of the study are also mainly carried out from these two aspects. The three major regional economic organizations in the world, the European Union, the North

American Free trade region, and the Asia-Pacific Economic Cooperation, all through the "process" stage and "state" phase before the final formation. Therefore, the theory of regional economic integration provides a theoretical basis for regional economic organizations to find a suitable method for improving the level of trade facilitation.

## ***2.2 Previous theories***

### ***2.2.1 Theory of comparative advantage***

The theory of comparative advantage was put forward by David Ricardo (1817). He analyzed the technology gap between the two countries that leads to differences in production costs of different products, resulting in international trade generation. According to the Theory of International Trade Division of labor, each country produces and exports some products with comparative advantages, and imports products with relative disadvantages of production. In this process, each country can obtain the benefits of the Division of International Labor through international trade, and the theory of comparative advantage explains how international trade is generated. David Ricardo thought that in the process of trade, the State should actively pursue the free trade policy, and then through the export of products with production advantages, import production-disadvantageous of products, thus promoting the development of trade between countries.

### ***2.2.2 Transaction cost theory***

In the book "The Nature of the enterprise", Coase (1937) proposed the transaction cost theory, which defines the concept of transaction costs as "the most obvious cost in the process of organizing a production is to find the cost of relative prices", "the cost of negotiating and contracting for each transaction occurring on the market" and "the cost of other aspects of the existence of the price mechanism". In summary, transaction costs include prior transaction costs and after-action transaction costs. The prior transaction cost generally includes search cost, information cost, bargaining cost, decision cost and supervision cost. The afterwards transaction cost refers to the cost of default that is caused by the failure to fulfill the contract. According to Coase's transaction costs, there

are costs to trading on the market, because the transaction takes time and opportunity to discover and complete. The most obvious manifestation of transaction costs in international trade is that when a country's products are exported to another country, customs clearance is required during transit, time is taken, and the site of the importing country is occupied, which result in transaction costs. Transaction costs can be negotiated between the two sides of the transaction to reach agreement on certain aspects, so that the cost can be reduced.

### ***2.2.3 Customs Union theory***

The founder of the Customs Union theory was Jacob Viner, he explained in detail in *The Customs Union Issue* (1950), in which he defined the customs union, which, in his view, refers to the agreements signed between two sides or multiple parties for a better trade and exchange to reduce tariffs and so on, so that these countries have a unified border, with lower trade costs on their territory, which can enhance the competitiveness of the products produced by Member States, because, in terms of comparative advantage, a country can import its own scarce products from other Member States and pay cheaper prices. Because of tariff exemptions, resources in member countries can be used effectively and yields have increased significantly, at the same time, through a professional division of labor, the consumption spending on the commodity in the country declined and then can spend capital on the consumption of other commodities, thus expanding social demand and resulting in a significant increase in trade volumes. The Allies have free trade and common external tariffs, which are very beneficial to the Allies and can significantly improve the competitiveness of the Allies. When a non-member's product wants to enter the Allied market, it is required to pay the corresponding tariff, and unless the price of the product of a non-member State drops to a sufficiently low level, it is unable to compete with the Member States that produce the same product in the allied countries. Therefore, the protection of Member States by the Customs Union can promote the optimal allocation of resources among Member States and enhance the level of economic development of each Member State.

#### ***2.2.4 Free Trade theory***

The theory of free trade is the core of international trade theory, and it is also a basic principle followed by various trade theories and trade policies that have emerged since then. With the rapid pace of globalization and the urgent need for capital to break through the barriers to free movement, developed countries have strongly advocated trade liberalization, and developing countries, after gaining the benefits of globalization, have strongly favored the removal of barriers and the promotion of liberalization policies. Meade (1955) put forward the theory of free trade on the basis of the customs Union. The meaning of free trade theory is that two or more countries can establish a free trade area by entering into agreements, in which countries are free to trade and remove trade barriers in types of tariff or non-tariff, and at the same time, these countries change certain policies, reducing some barriers in domestic investment by other countries and expanding market access restrictions so that countries involved in free trade zone can achieve a certain degree of free movement of factors of production, such as goods, services, people, technology and science, etc. With regard to countries involved in the theory of free trade, there can still be independent tariff-making rights. This way is the generally adopted by the countries currently involved in the theory of free trade.

#### ***2.3 International studies on the trade facilitation***

Wilson, Mann, and Otsuki (2004) estimated and measured the relationship between trade facilitation and trade flows through a disaggregated study of manufactured goods in 75 countries. Based on this relationship, calculated the extent of the impact of trade facilitation on bilateral trade flows, followed by the filtrate of 4 specific indicators: port facilities, customs environment, regulatory environment and electronic commerce, and organized the relevant panel data during 2000-2001. Then used the gravity model of trade to make an empirical analysis of the collected data. The results showed that with the deepening of globalization, the demand for trade facilitation is increasing in countries or regions, and the increase of trade facilitation has directly contributed to the

expansion of export trade volume; in terms of world export trade, the growth volume was close to \$400 billion, which made the export growth rate significantly higher than the import growth rate. This result was due to an increase in exports to the OECD market. In addition, the results of the study demonstrated that if a further reform wants to be achieved in trade facilitation, they should rely on the continuous improvement of laws and systems, rather than on the continuous expansion of investment projects. Allen Dennis (2006) examined the potential contribution of regional trade agreements, as well as trade facilitation improvements, in enhancing the development prospects of the Middle East and North Africa (MENA) region. Using the Global Trade Analysis Project (GTAP) model and database, the article observed that both intra-regional integration and integration in the EU would have a beneficial impact on welfare in the MENA region. Furthermore, these welfare gains are observed to at least triple when the implementation of the RTAs is complemented with trade facilitation improvements. Martinez-Zarzoso Inma and Márquez-Ramos Laura (2008) analyzed the impact of trade facilitation on sectoral trade flows. The article used several estimation techniques (i.e. OLS, PPML and Harvey models) to estimate the enhanced gravity equation for 13 exporters and 167 importers. A common result was that trade flows increase by lowering transport costs and the number of days required to trade. Evdokia Moïsé (2013) assessed the impact of specific trade facilitation measures on developing countries' trade through the OECD indicators. A total of 16 trade facilitation indicators were constructed with the aim to estimate the addressing specific hurdles in the trade and border procedures of a given country. The author believed that the greatest impact on trade volumes and trade costs in this area were imports as well as export efficiency, such as availability of relevant information, the simplification and harmonization of documents, streamlining of procedures and automated usage process, etc. The combined effect of these improvements would be greater than the simple sum of the impact of an individual measure, in which the total transaction costs of low-income countries decreased by almost 14.5%, the number of low-and middle-income countries decreased



by about 15% and the middle-income countries decreased by about 13%. Kong and Dong (2015) investigated the trade facilitation of countries along the "Belt and Road" and the empirical results showed that the trade facilitation had a greater role in promoting trade than regional economic organizations or tariff relief factors. Moreover, since the degree of trade facilitation varied from region to area, the trade potential among different regions would be significantly greater than the latent trade potential among countries in the same region. For the construction of the "Belt and Road", they should pay attention to cooperation and innovation in the perspective of trade facilitation and the establishment of diversified cooperation mechanisms, to achieve connectivity and common prosperity between the Asian and European continents.

#### ***2.4 International studies on the impact of trade facilitation on exports***

The study of T Iwanow (2009) used a new panel dataset for 124 developed and developing countries, for the period 2003-2004 to assess the impact of trade facilitation and other trade-related institutional constraints on the performance of manufacturing exports, particularly in the African region. The article estimated a standard trade gravity model augmented with trade facilitation, regulatory quality, and infrastructure indicators. The results of the empirical analysis demonstrated that the increase in the volume of trade exports of African countries depends on the increase in the level of trade facilitation, as trade facilitation enhances the quality of regulation, improves infrastructure construction and creates a sound development environment for trade. The research written by Dennis and Shepherd (2011) showed that in developing countries, the improvement of export diversification in trade could promote trade facilitation. They found that every 10% reduction in international transport costs and domestic exporting costs (documentation, inland transport, port and customs charges), in 118 developing country samples, export diversification gains a rise by 4% and 3% respectively, and customs costs also played a particularly important role in these results. Because lower market entry costs could also promote diversification, it was less effective (1%). The article also found that, for poorer countries, the level of trade

facilitation had a more important impact on the country's diversification. Empirically, the article uses alternative independent variables, different national samples and alternative econometric techniques, so that the results have a highly robust type. In addition, the article links these findings to the latest advances in trade doctrines that emphasize the heterogeneity of enterprises and the growth of broad marginal trade. Robert C. Feenstra and Ma Hong (2014) examined the linkages between trade facilitation and export varieties among a wide range of countries. The article uses port efficiency to measure trade facilitation, in addition to bilateral import tariffs, whether OECD member countries and whether there are regional trade agreements. They found that the wide marginal contribution of port efficiency to exports is significant, and bilateral import tariffs have a negative impact on export varieties. Positive effects were confirmed when examining trade between countries that did not have a common land boundary, or between OECD member States and non-OECD countries. Zhou (2017) having collated the relevant data of China and its 135 trading countries, using the stochastic frontier gravity model to make an empirical analysis of the impact of trade facilitation on export efficiency, and then using the non-efficiency model to test it. The article points out that China's trade facilitation and export efficiency are still low compared with those of developed countries, so China has a lot of space for improvement in this respect. Moreover, it is concluded from the analysis that export inefficiency is a significant factor restricting the growth of China's exports, so if the trade facilitation of China and its trading partners is improved, then export efficiency will be significantly improved.

From the previous literature review, it can be seen that since the "Belt and Road" initiative emerged, it has become a hot topic in the economic field, especially in international trade, and the related theoretical and empirical researches are endless, also the research results are very rich, which provide many valuable theoretical and practical experience for the researchers of related subjects in the future.

### 3. Analysis on "Belt and Road" Area Situation and Trade Status Quo

#### 3.1 "Belt and Road" overview

The Silk Road Economic Belt and the 21st-century Maritime Silk Road, referred to as the Belt and Road Initiative (abbreviated B&R<sup>1</sup>), is the transnational economic Belt initiative and led by the government of the People's Republic of China in 2013.

East Asia	West Asia	South Asia	Middle Asia	CIS	Mid-East Europe
Mongolia	Iran	India	Kazakhstan	Russia	Poland
Singapore	Iraq	Pakistan	Uzbekistan	Ukraine	Lithuania
Malaysia	Turkey	Bangladesh	Turkmenistan	Belarus	Estonia
Indonesia	Syria	Afghanistan	Tajikistan	Georgia	Latvia
Myanmar	Jordan	Sri Lanka	Kyrgyzstan	Azerbaijan	Czech Republic
Thailand	Lebanon	Maldives		Armenia	Slovakia
Laos	Israel	Nepal		Moldova	Hungary
Cambodia	Palestine	Bhutan			Slovenia
Vietnam	Saudi Arabia				Croatia
Brunei	Yemen				Bosnia & Herzegovina
Philippines	Oman				Montenegro
	UAE				Serbia
	Qatar				Albania
	Kuwait				Romania
	Bahrain				Bulgaria
	Greece				Macedonia
	Cyprus				
	Egypt				

Diagram 3.1- Belt and Road, list of 65 countries.

Source: Wali Zahid (2015)

Up to now, the "Belt and Road" covers Mongolia, Egypt, 10 ASEAN countries, including Singapore and Malaysia, etc., 18 countries in West Asia, including Iraq and Saudi Arabia, etc., 8 countries in South Asia, including India and Pakistan, etc., and Central Asia, including Kazakhstan and Uzbekistan, etc., Russia, Ukraine and other 7

<sup>1</sup> Western Development Department of National Reform and Development Commission. *Committee and other relevant departments to standardize the "Belt and Road" initiative in English translation.*

National Development and Reform Commission of the People's Republic of China. Beijing. [2018-03-24]

CIS countries, as well as 16 countries of the Middle East and Europe, including Poland, the Czech Republic, etc., and other 65 countries and regions.

As an important material link platform, the "Belt and Road" makes the goods in the East and West circulate to each other, but this is not only an economic "way", but also cultural exchange, and in which it also playing a considerable role in this exchange.

The B&R aims to become a trade and infrastructure network connecting Asia with Europe and Africa along ancient trade routes. For regional connectivity, China is working in aviation, power, rail, road and telecommunications projects with participating countries.

#### **The Belt and Road Initiative: Six Economic Corridors Spanning Asia, Europe and Africa**

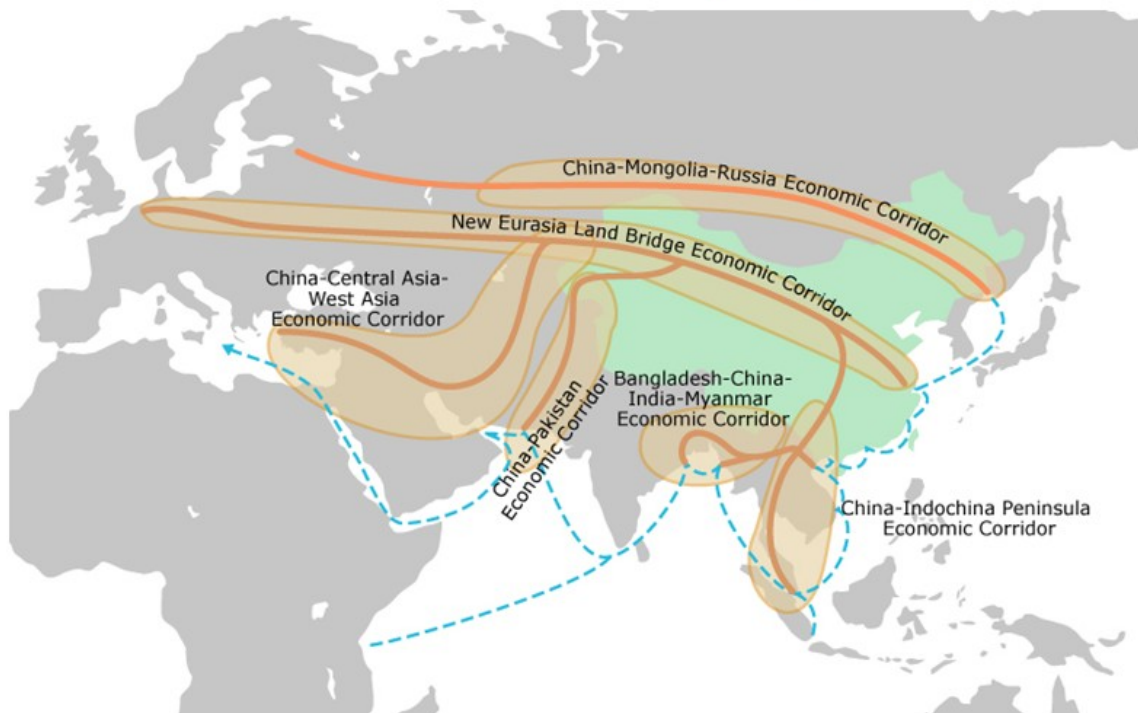


Diagram 3.2 - Five main corridors in B&R

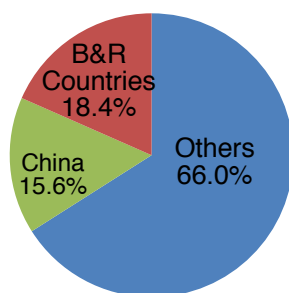
Source: Hong Kong Trade Development Council (HKTDC)

The Belt and Road Initiative focuses on six corridors that are connections among those areas: 1. The New Eurasia Land Bridge Economic Corridor; (2) The China-Mongolia-Russia Economic Corridor;(3) China-Central Asia-West Asia Economic

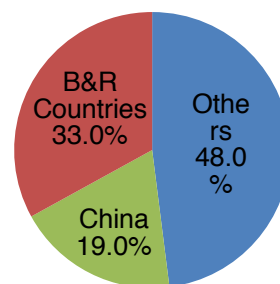
Corridor;(4) China-Indochina Peninsula Economic Corridor;(5) China-Pakistan Economic Corridor;(6) Bangladesh-China-India-Myanmar Economic Corridor.

As can be seen from above, China's trade exchanges with the regions along the route are mainly ASEAN, Western Asia and Central and Eastern Europe, while the number of countries along the three regions also accounts for more than 70%. The scale of GDP along the region is \$2.8 billion, nearly 40% of the world's total. Under the "Belt and Road" Initiative, China's trade with countries along the route was as high as 9.5 billion in 2016, accounting for one-fourth of China's total trade in goods.<sup>2</sup>

Share of Global GDP



Share of Global Population



Pie

Chart 3.1- Share of GDP and Population of Countries along the "Belt and Road" and China in 2017

Source: *Big Data Report on Trade Cooperation under Belt And Road Initiative 2018*

From the chart 3.1 and relevant data we can see, in 2017, the sum of GDP in countries along the "Belt and Road" was forecast at \$14.5 trillion, accounting for 18.4% of global GDP; the total population was projected at \$3.44 billion, representing 48% of the global population. Thus, most of countries in this region are developing countries, with a large population and low per capita GDP, but the rich resources contained in which can provide a great advantage for future trade and occupy an important position in the global trade map.

<sup>2</sup> Data collected from *Research report on industrial cooperation and development of countries (regions) along China and the Belt and Road (2017)*.

### 3.2 Analysis on trade status quo along the route

Due to data incompleteness, during the data collection, Yemen, Turkmenistan, Syrian Arab Republic are removed from countries in the "Belt and Road" region (including China). In the calculation process, the total amount of foreign trade represents the sum of exports and imports of goods, rather than the total number of single exports in previous studies.

Table I

World Total International Trade in 2013-2017

YEAR FLOW	2013	2014	2015	2016	2017
	MEASURE: US Dollars at current prices Trillion				
Export	23,452	23,847	21,152	20,681	22,750
Import	22,741	24,258	20,709	20,232	22,193
Total	46,193	48,105	41,861	40,913	44,943
Growth Rate (%)	2.8	4.1	-12.9	-2.2	9.8

Table II

B&amp;R Area and China Total International Trade in 2013-2017

Measure YEAR	Total Volume in International Trade (Trillion US Dollar)		Share in International Trade (Trillion US Dollar)		Growth Rate (%)	
	B&R Area	China	B&R Area	China	B&R Area	China
2013	15,443	4,475	50.77	9.69	4.3	7.8
2014	15,734	4,704	50.62	9.98	1.9	5.1
2015	13,769	4,363	50.53	10.42	-12.4	-7.2
2016	13,328	4,151	50.55	10.14	-3.2	-3.2
2017	14,877	4,652	50.62	10.35	11.6	12.1

Table I and II are the statistical results of the foreign trade situation between the world and the "Belt and Road" countries and China in 2013-2017 respectively. It is easy to see that in 2013 and 2014, it was a good time for emerging economies to develop and the world economy is developing rapidly, the global trade volume is rising, and the economic globalization has been further upgraded. But that is why the Global Financial Storm that began in 2015, the by-products of a series of bubble economies, such as the

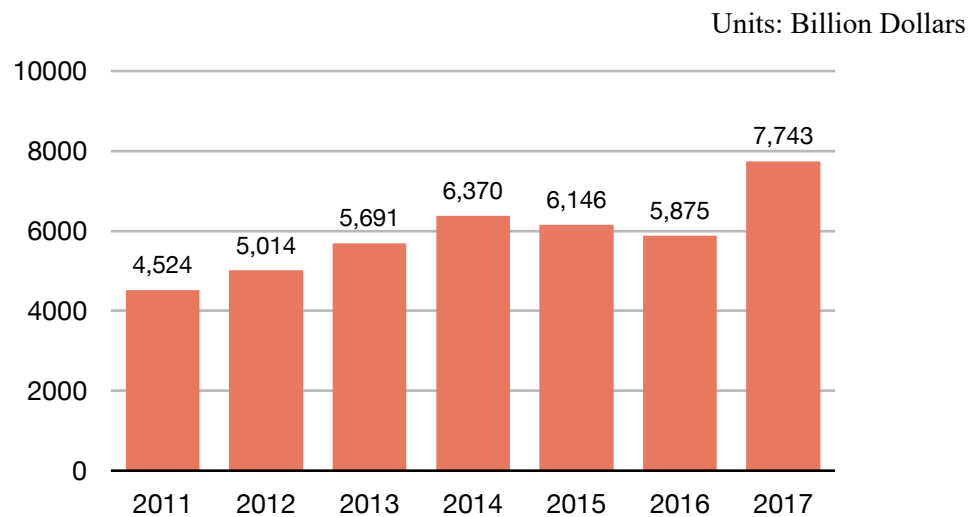
plunge in U.S. stocks, could quickly permeate the entire international market, showing negative growth in world trade (also covering areas of the "Belt and Road" countries) in the 2015 and 2016. Combined with the prevalence of trade protectionism, the global economy was in a recession, the B&R region has also been hit hard, and although China, which is a developing country that dominated by the "state-owned economy", its emerging economies have also been negatively affected by the crisis of the two years.

In terms of total volume of trade, in 2017, South Korea's foreign trade volume was the highest, at \$1050.84 billion; the second was Singapore, with a trade volume of \$697.21 billion; India ranked third, with a trade volume of \$617.04 billion; Russia and the United Arab Emirates also trade more than \$500 billion. In terms of exports, South Korea has the highest foreign exports, at \$572.73 billion, followed by Singapore and Russia, at \$369.55 billion and \$357 billion, respectively. Among the top 10 "Belt and road" countries in terms of foreign trade, export volumes are all greater than \$200 billion, with the exception of Turkey. In terms of imports, South Korea imports the highest, at \$478.11 billion, followed by India and Singapore, at \$356.7 billion and \$327.67 billion, respectively. "Belt and Road "the top 10 countries of foreign trade, with the exception of Malaysia, import volumes are all greater than \$200 billion<sup>3</sup>.

Nevertheless, the countries of the "Belt and Road" region in 2013-2017, their total foreign trade accounted for a relatively stable share of the world's total foreign trade, and steadily rising, of which China's share of trade has been maintained at around 10%. In terms of the growth rate of foreign trade, the growth rate of the "Belt and Road" region and China are at a high level, exceeding the global average growth rate, showing that the region's trade potential is huge.

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<sup>3</sup> Data from China Economic Information Network. <http://ydy1.cei.cn/page/Default.aspx>



Histogram 3.1- Volume of China's exports to countries along the "Belt and Road" in 2011-2017

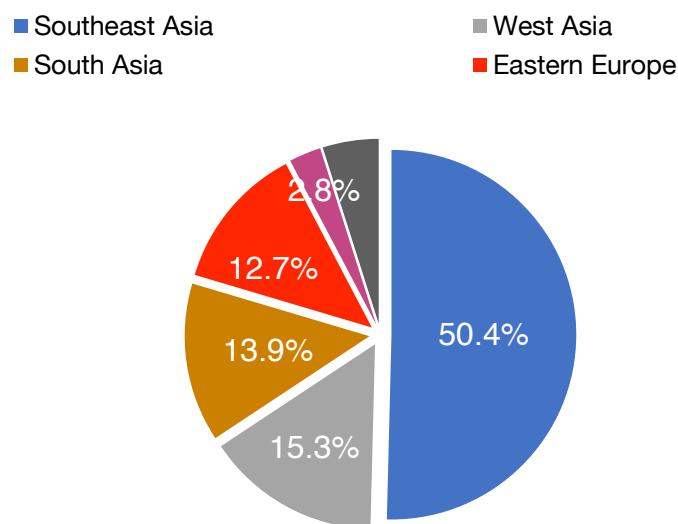
Source: China Economic Information Network.

In 2013-2017, China and the "Belt and Road" countries total volume of foreign trade was \$6.975623 trillion and trade growth rate with related countries was higher than the overall growth rate of the outside world, the B&R countries became an important force for China's foreign trade to accelerate economic recovery. Big data analysis shows that trade cooperation between China and Asia and Oceania and west Asia is at a high level. In 2017, South Korea, Malaysia, India, Russia and other countries were China's most important "Belt and Road" trading partners. In the same year, central Asia was the region with the fastest growth rate and the growth rates in trade with China of Qatar, Mongolia, Montenegro and Kazakhstan were all exceeding 35%.

In 2016, affected by sluggish global economic improvement, reduced demand in major countries and falling commodity prices in the international market, China and world's total trade and export volume declined. Among them, the total volume of trade was \$3702.16 billion, down by 6.4%, which was narrower than the decline of 8.1% in 2015. Exports fell 7.0% to \$2,113.84 billion, extending a 2.9% decline from 2015. In 2017, China's total import and export volume with "Belt and Road" countries reversed



the negative growth situation for two consecutive years and reached \$1,440.32 billion, an increase of 13.4% over 2016, 5.9 % higher than China's overall growth rate and accounting for 36.2% of China's total foreign trade volume. Exports totaled \$774.26 billion, up by 8.5% from 2016 and accounting for 34.1% of China's total exports. After a peak value in 2014, although China's total exports of countries along the area all the way down, but still higher than in 2013 (\$5.609 trillion) before, and China's total trade volume proportion is on the rise. It was overtaken in 2017, which means the B&R Initiative began to bring new trade opportunities and markets to China and all the area



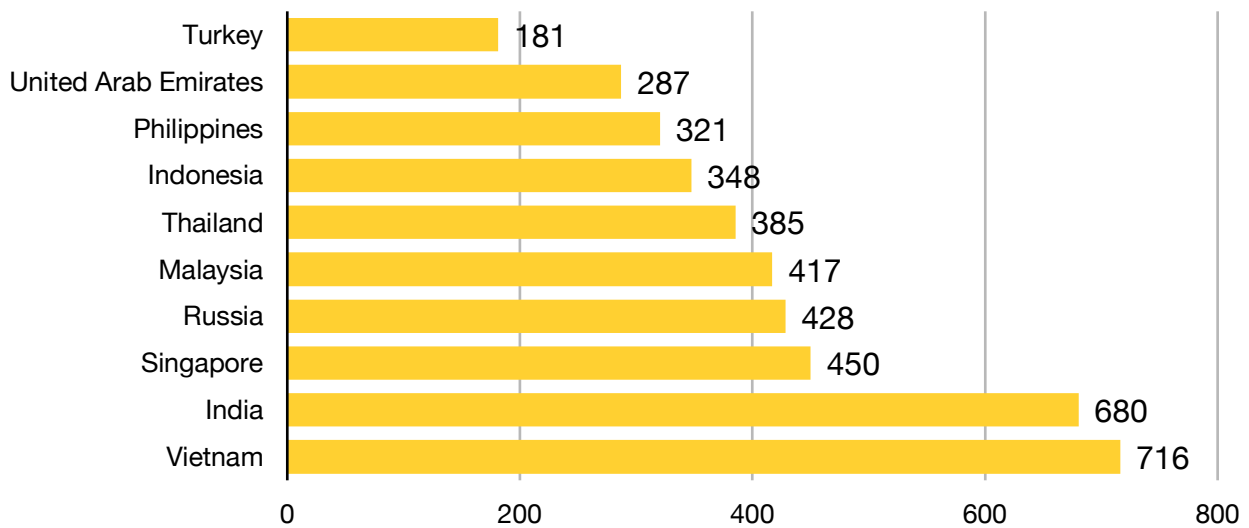
along the route.<sup>4</sup>

Pie Chart 3.2- China's exports share to "Belt and Road" various regions

Source: *Big Data Report on Trade Cooperation under Belt And Road Initiative 2018*

<sup>4</sup> Source from BELT AND ROAD PORTAL. [Yidaiyilu.gov.cn](http://Yidaiyilu.gov.cn)

Units: Billion Dollars



Histogram 3.2- China's Top 10 Exports Countries in 2017

Source: China Economic Information Network.

It demonstrated from the grams that most of the countries currently close to China's export trade come from Southeast Asia, followed by Northeast Asia and South Asia. In 2017, China had the largest share of exports to the Asian Oceania region, at \$390.06 billion, accounting for 50.4% of China's exports to the "Belt and Road" countries, due to the overall development of the region's economic level, the market is more open, and the geographical location is adjacent to China, so the trade cost is low and the market is huge. On the contrary, exports to Central and Eastern Europe accounts for only 12.7%, because although the region is mature and open, it is far away from China and has higher transportation costs, which makes many industries unable to export or are not selected under the principle of proximity. In Western Asia and Africa, for their part, trade volumes have declined as a result of security factors caused by political unrest.

## **4. Trade facilitation level calculation of "Belt and Road" countries**

### ***4.1 Trade facilitation indicator system***

#### ***4.1.1 Construction Principles***

Scientificity. Specifically, in the construction process, each indicator should be conformed to consist with facts, to ensure the authenticity and comprehensiveness of the final results. Accessibility. There are some indexes whose data cannot be easily obtained or are missing in the database, so it is necessary to consider whether this index can be replaced by similar ones, which is also the flexibility in data acquisition. Systematicness. Means that the whole system should be systematic and organized to a certain extent, and indicators should be classified and sorted.

#### ***4.1.1 Data selection***

Portugal-Perez and Wilson (2010) established a trade facilitation index system including Physical infrastructure, Information and Communications technology, Border and transport efficiency, Business and regulatory environment and other indicators, measured the actual trade facilitation situation of more than 100 countries in the world. According to *The Global Enabling Trade Report* published by The World Economic Forum, four primary indicators: Market access, Border administration, Infrastructure and Operating environment are selected, and seven specific secondary indicators are included.

In the indicator system to be constructed in this paper, not only uses the relevant experience in the selection of the above two established indicators for reference, but also comprehensively considers the economic and trade characteristics of the countries along the "Belt and Road". As a result, five representative indicators are selected, which are: Regulatory environment, Infrastructure, Border administration, Business environment and Information and communications technology (ICT).

Among the five first-level indicators in the index system constructed, a total of 14 second-level indicators (Appendix I) are included. Regulatory environment refers to the current system and legal environment of a country, is divided into "Intellectual property

protection," "Transparency of gov. Policymaking" and "Burden of gov. Regulation" these three secondary indicators. Infrastructure mainly measures the economic foundation of a country and the convenience of transportation. Border administration has a direct influence on commodity clearance efficiency, and at the same time reflects the tax level of the economy as well as transit management, which can be divided into "Irregular payments and bribes" and "Burden of customs procedures". Business environment is a description of the country's overall trade opening degree, trade barriers and financial help, which is divided into "the Trade tariffs", "Prevalence of non - trade-related barriers" and "Ease of access to loans". Information and communication technology is an important performance of technological and economic development, which is divided into "Availability of latest ICT technology" and "Extent of business Internet use". All the indicator data has the corresponding code in *Global Competitiveness Report*, as detailed in Appendix II. The corresponding value range is between 1-7 or 1-100 and 7 or 100 represents the best.

#### **4.1.2 Data processing**

In the index system constructed, there are some differences in some data intervals, so in the calculation of trade facilitation index, this dissertation uses indexation method to process the data. First, by using the  $\pi = \pi_k / \pi_{max}$  formula to unify the interval of all parameters into [0,1], where  $\pi$  is a new parameter of secondary indicator after processing,  $\pi_k$  is the raw data collected,  $\pi_{max}$  is the actual value of the country with the largest value in selected secondary indicator. Secondly, a simple arithmetic averaging method is used to process the new parameters, and the five primary parameters of RE, IN, BA, are and ICT are obtained respectively. Finally, the final trade facilitation Index (TFI) can be obtained by also using a simple arithmetic average to process five primary parameters (All parameter values should be within the [0,1] interval).

#### **4.2 Calculation and analysis of trade facilitation level**

Due to the availability of data, 50 countries (including China) along the "Belt and Road" are selected as research samples to calculate the trade facilitation index. At last,

the level of trade facilitation in the countries along the "Belt and Road" during 2013-2017 to be demonstrated in the Appendix (App. III).

We can refer to the classification criteria for trade facilitation levels in previous studies,  $TFI < 0.6$  represents low levels of trade facilitation,  $0.6 \leq TFI < 0.7$  represents a medium level,  $0.7 \leq TFI < 0.8$  represents a high level of trade facilitation,  $0.8 \leq TFI$  indicates a very high level of trade facilitation. In terms of data for these five years, Singapore, the UAE, has been at the forefront, which is likely to be linked to locally implemented policies. Since the severe recession in 2001, the Singaporean government has been striving to transform into a knowledge-based economy and becomes a global "Free Port". In order to promote its own exports, the UAE has established trade relations with 179 countries and regions around the world, and 6 of its 7 Emirates have set up free trade zones in their own regions. The higher the level or trend of economic development in countries and regions, the more developed its trade will be, such as other top-ranked countries: Qatar, Saudi Arabia, China, Bahrain, etc., and their trade facilitation levels are much higher than those of Nepal, Bangladesh, Cambodia, etc., the mutually reinforcing role between the level of trade facilitation and economic development is amply demonstrated.

The "Belt and Road" area, during 2013-2017, the trade facilitation level of each country only fluctuated within a narrow range and the level of trade facilitation of countries with different levels of economic development is also slightly different. Of the 50 countries selected, 26% were at a low level, 40% were at the middle of the list, 20% had a high level and only 14% had extremely high levels of trade facilitation, most of which were concentrated within the 0.6~0.8 range. The results of this measurement are in line with the real economic situation, because the more developed countries, the more abundant the funds, the better their infrastructure construction and economic superstructure environment and naturally, their international trade development is also higher.

## 5. Analysis and Empirical Test

### 5.1 Gravity model settings

The initial source of the gravity model was Newton's law of gravitation, which was applied to academic research in physics, after which the gravity model was introduced into the field of international trade. Isard&Peck (1954) and Beckerman (1956) believe that, in terms of geographical factors, the closer the location of two countries, the more conducive to trade between the two countries, the more frequently trade is carried out, the greater the scale of trade will be formed. Tinbergen (1962) and Poyhonen (1963) concluded that the size of trade between regions and their total economic volume, that is, GDP, is positively correlated. Linnemann (1966) transformed the traditional trade gravity model, added the population variable to the model, and then proved the positive correlation between trade volume and population through empirical evidence.

The basic formula of the trade gravity model is:

$$T_{ij} = \alpha_0 Y_i Y_j D_{ij} A_{ij} \quad (5.1)$$

Among them,  $T_{ij}$  is the trade flow between two countries,  $Y_i$  represents the gross domestic product of country I,  $Y_j$  is the gross domestic product of Country J,  $D_{ij}$  is the distance between country I and J,  $A_{ij}$  as other variables.

After logarithmic deformation of the formula, the following are obtained:

$$\ln T_{ij} = e^{\alpha_0} + \alpha_1 \ln Y_i + \alpha_2 \ln Y_j + \alpha_3 \ln D_{ij} + \alpha_4 \ln A_{ij} + u_{ij} \quad (5.2)$$

Among them,  $\alpha_0$  is a constant,  $\alpha_1, \alpha_2, \alpha_3$  are elastic coefficients,  $u_{ij}$  is a random error term. The deformed model can directly show the connection between the explanatory variables and the explained variable, and the coefficient values of explanatory variables indicate the degrees of their influences on the explained variable.

#### 5.1.1 Variable selection

During research of this dissertation, which is, the impact of the trade facilitation level on China's export trade along the " Belt and Road" in 2013-2017, according to the characteristics of the regions, and in view of the availability of data, the selected variables are mainly Gross Domestic Product, distance, population size, level of trade

facilitation, tariff rate; policy and public boundaries are selected as virtual variables.

The model is set to:

$$\ln EXP_{jt} = e^{\alpha_0} + \alpha_1 \ln GDP_{jt} + \alpha_2 \ln POP_{jt} + \alpha_3 \ln DIS_{ij} + \alpha_4 TAR_{jt} + \alpha_5 \ln TFI_{jt} + \alpha_6 POL_{jt} + \alpha_7 BOR_{jt} + u_{ij} \quad (5.3)$$

1.  $EXP_{jt}$  is the export volume of China to country J during the period t, and it is the explained variable of the gravity model in this paper. Through the empirical analysis of other explanatory variables such as trade facilitation, the influence of explanatory variables in the model on export is tested. The data comes from the United Nations COMTRADE and the unit is dollar.

2.  $GDP_j$  is the gross domestic product of country J in period t, which can directly reflect the economic scale and trade demand of a country and is positively correlated. The data comes from the World Bank database and the unit is dollar.

3.  $POP_{jt}$  is the total population of country J in period t. The more people there are in a region, the more demand there is for consumption and the more trade. At the same time, the abundant labor force reduces production costs and promotes trade. This data comes from the World Bank database and the unit is person.

4.  $DIS_{jt}$  represents the distance between China and the capital of country J. Data from CEPII and the unit is kilometer.

5.  $TAR_{jt}$  represents the average tariff of country J during period t. Generally speaking, the lower the average tariff is, the higher the economic aggregate is. This variable shows a negative correlation. Data from the *Global Competitiveness Report*.

6.  $TFI_{jt}$  is the trade facilitation index. The role of trade facilitation lies in eliminating trade barriers between economies as much as possible, creating a better business environment, and promoting trade by improving infrastructure and adopting trade measures. Therefore, this variable is positively correlated. Data from the calculation of the last chapter in this dissertation (Appendix III).

7.  $POL_{jt}$  is a dummy variable, representing whether China has signed a mutually beneficial trade agreement or relevant policies with country J. If so, it takes the value

of 1; otherwise, it takes the value of 0. The data comes from China Free Trade Zone Service Network.

8.  $BOR_{jt}$  is a dummy variable, which indicates whether China and country J have a common border, that is, whether they share borders. If two countries are adjacent, the transportation cost will be greatly reduced, which is conducive to export trade. Therefore, the expected coefficient of this variable is positive. If the two countries share a common border, value 1, and vice versa.

Variable	Data source
$EXP_{jt}$	UN Comtrade
$GDP_{jt}$	the World Bank
$POP_{jt}$	the World Bank
$DIS_{ij}$	CEPII
$TAR_{jt}$	Global Competitiveness Report
$TFI_{jt}$	Calculation in Chapter IV
$POL_{jt}$	China FTA Network
$BOR_{jt}$	Google Map

Diagram5.1- Variables and sources

In addition, since the research object of this paper is China's export trade, relevant data of China are not included in the model.

## 5.2 Empirical test

Based on the above statistical analysis, this section conducts an empirical analysis of the impact of trade facilitation in the regions along the “Belt and Road” on China's export. In addition to the overall situation of the areas along the route, this section also carries out a comprehensive and in-depth study of this issue within both regional and factorial aspects.

### 5.2.1 Influence of overall trade facilitation level on China's export trade



This paper uses SPSS V25 to conduct regression analysis of panel data of 49 countries along "Belt and Road" based on random effect, and applies the extended trade gravity model (5.3) to conduct the empirical test, results as follows:

Table III  
Model Summary of Regression

<b>Model Summary<sup>b</sup></b>				
Model	R	R Square	Adjusted R Square	Durbin-Watson
1	.888 <sup>a</sup>	0.788	0.782	0.481
a. Predictors: (Constant), BOR, lnGDP, POL, lnTAR, lnTFI, lnDIS, lnPOP				
b. Dependent Variable: lnCHNEXP				

The regression results of the above output show that the complex correlation coefficient  $R$  is 0.888, which reflects a very large degree of linear correlation between all independent variables ( $\ln GDP$ ,  $\ln POP$ ,  $\ln DIS$ ,  $\ln TAR$ ,  $\ln TFI$ ,  $POL$ ,  $BOR$ ) and dependent variable (China's export). The determination coefficient  $R Square$  is 0.788, indicating that the influence of countries along "Belt and Road" on China's export trade accounts for 78.8%. It can be seen that the trade gravity model constructed in this paper is feasible and has practical significance.

Table IV  
ANOVA Test for the equation

<b>ANOVA<sup>a</sup></b>					
Model		Sum of Squares	df	F	Sig.
1	Regression	694.657	7	124.591	.000 <sup>b</sup>
	Residual	186.381	234		
	Total	881.039	241		

a Dependent Variable: lnCHNEXP

b Predictors: (Constant), BOR, lnGDP, POL, lnTAR, lnTFI, lnDIS, lnPOP

ANOVA is the result of variance analysis to test the overall significance of the regression model, in which the  $F$  statistic is 124.591 and the  $p$  value is  $< 0.001$ , which means under the test level  $\alpha = 0.05$ , it can be considered that the fitted multiple linear regression equation is statistically significant.

Table V

Coefficients of the Model

<b>Coefficients<sup>a</sup></b>				
	Unstandardized Coefficients	Standardized Coefficients	<i>t</i>	Sig.
	<i>B</i>	Beta		
(Constant)	14.422		6.364	0
lnGDP	0.719	0.599	6.943	0
lnPOP	0.288	0.249	2.706	0.007
lnDIS	-1.682	-0.357	-7.228	0
lnTAR	-0.188	-0.102	-2.52	0.012
lnTFI	1.417	0.116	2.213	0.028
POL	0.587	0.118	3.023	0.003
BOR	0.065	0.217	5.145	0
a Dependent Variable: lnCHNEXP				

In the Coefficients table of the results output, it is shown that  $p$  values of partial regression coefficient test of all variables and constant terms are  $< 0.05$ , indicating that they are statistically significant and can be included in the final regression model. Meanwhile, the significance of the Standardized Coefficients of output lies in Standardized regression Coefficients that can compare the effects of different independent variables on dependent variables.

Based on the analysis of the above results, the final multiple linear regression equation can be written as:

$$\ln EXP = 14.422 + 0.719 \ln GDP + 0.288 \ln POP - 1.682 \ln DIS - 0.188 \ln TAR + 1.417 \ln TFI + 0.587 \ln POL + 0.065 \ln BOR$$

Table VI

## Summary of Regression Results

Variables	$\beta$	95%CI	P value (sig)
<i>lnGDP</i>	0.719	(0.515,0.923)	<0.001
<i>lnPOP</i>	0.288	(0.078,0.498)	0.007
<i>lnDIS</i>	-1.682	(-2.140,-1.223)	<0.001
<i>lnTAR</i>	-0.188	(-0.335,-0.041)	0.012
<i>lnTFI</i>	1.417	(0.156,2.679)	0.028
<i>POL</i>	0.587	(0.204,0.969)	0.003
<i>BOR</i>	0.065	(0.047,0.0657)	<0.001

1. Gross Domestic Product of the importing country (*GDP*): the regression coefficient is 0.719, which is significant. This shows that for countries along the "Belt and Road" route, when their GDP shows a growth trend, it will drive the growth of China's export trade. Moreover, for every 1% increase in the GDP of importing countries, China's export volume will increase by about 0.72%.

2. Total population of importing country (*POP*): the regression coefficient is 0.288. The results are significant. When the total population of importing country increases, China's export trade increases. This may be closely related to the composition of countries along the "Belt and Road" line. When the population increases, the size and diversification of its market demand increase, which is conducive to the development of international trade activities.

3. Distance between importing country and China (*DIS*): the regression coefficient is -1.682, with significant results. For every 1% increase in the distance between importing countries and China, the volume of export trade decreases by 1.7%. This shows that the distance has a great obstacle to China's export trade. With the increase of the distance, the transportation cost and time cost will become higher and higher, which will make the importing country turn to other countries to import goods. Therefore, distance has become an important factor restricting the trade between countries along "Belt and Road".

4. The average tariff rate of the importing country (*TAR*): the regression coefficient is -0.188, which is significant. This means that for countries along the "Belt and Road", a 1% increase in the average tariff rate of importing countries will reduce the volume of China's export trade by about 0.19%. This is mainly because the rise of tariff rate will lead to the increase of export prices, which will affect the competitiveness of products.

5. Import country's trade facilitation index (*TFI*): the regression coefficient is 1.417, which is significant. This demonstrates that for countries along the "Belt and Road", every 1% increase in trade facilitation level will increase China's export trade volume by about 1.42%. It can be clearly seen that the trade facilitation level of importing countries plays an obvious role in promoting China's export trade, which basically achieves the ultimate goal of the empirical test in this paper.

6. Whether to sign the free trade agreement with China (*POL*): the regression coefficient is 0.587, which is significant. When two countries sign bilateral or multilateral trade agreements, the cost of trade will be greatly reduced, and thus increase the volume of trade between the two countries.

7. Whether the importing country borders on China (*BOR*): the regression coefficient is 0.065, which is significant. This shows that in today's high-speed development of transportation technology, whether two countries are adjacent or not

will only have a slight impact on the trade and the geographical advantages are even less obvious

The expected signs of the above independent variables (i.e. positive and negative influences) are consistent with the above prediction. One in all positive factors,  $\ln TFI$  regression coefficient is 1.417 and its 95% CI is (0.156, 2.679), shows that in the case of other factors unchanged,  $\ln TFI$  value every increase 1,  $\ln EXP$  increased by 1.417, which is higher than others who has a positive influence ( $\ln GDP$ -0.719,  $\ln POP$ -0.288,  $\ln POL$ -0.587). Obviously, compared with the trade facilitation, other factors that affect China's export trade slightly insufficient, but still cannot be ignored.

### 5.2.2 Impact of regional trade facilitation levels on China's export trade

In addition to the impact of the overall trade facilitation level of countries along the "Belt and Road" on China's export trade, the analysis of the actual situation of various regions can more directly and clearly show the extent of its impact. This section divides the regions along the route into three parts: (1)East Asia, south Asia and southeast Asia, (2)Central Asia, west Asia and north Africa, and (3)Central and eastern Europe. Next, this paper will conduct research on the impact of trade facilitation on China's export trade according to the three regions divided, so as to draw more constructive conclusions and put forward feasible suggestions. The following table is the basis for the specific regions and divisions of 49 "Belt and Road" countries besides China selected in this chapter.

Area	Countries	Characteristics
East Asia, South Asia, Southeast Asia	Bangladesh, Bhutan, Cambodia, India,	Close to China,
	Indonesia, Laos, Malaysia, Mongolia,	Cultural and trade
	Nepal, Pakistan, Philippines, Singapore,	exchanges are
	Sri Lanka, Thailand, Vietnam	frequent

Central Asia, West Asia, North Africa	Bahrain, Egypt, Israel, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Lebanon, Oman, Qatar, Saudi Arabia, Turkey, United Arab Emirates, Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Greece, Hungary, Latvia, Lithuania, Moldova, Montenegro, Poland, Romania, Russia, Slovakia, Slovenia, Ukraine	Mostly Islamic countries, Culture is similar  Countries close to each other and with lots of communication
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Diagram 5.2- Countries in Detail

According to the above partition results, SPSS V25 is used to conduct regression for the three regions respectively. The total results are as follows:

Table VII  
Regional Regression Results

Variables	East Asia, Southeast Asia	South Asia, North Africa	West Central and eastern Europe
<i>(Constant)</i>	20.671***	25.027***	-10.818
<i>GDP</i>	0.596*	0.244*	0.538***
<i>POP</i>	0.477	0.726***	0.544***
<i>DIS</i>	-1.479***	-2.470***	-1.4
<i>TAR</i>	-0.326*	-0.275	-0.421***
<i>TFI</i>	1.658	2.139**	5.064***
<i>POL</i>	1.038***	\	\
<i>BOR</i>	0.46	0.11***	.457***
R-square	0.885***	0.806***	0.824***

It can be seen from the above empirical results that the regression results of different regions have the same trend as the overall results, but there are obvious differences among different regions. For instance, one of the variables in importers — the total population. The population growth in southeast Asia for China's export trade of regression coefficient is not significant, and the absolute value is minimum, but this variable is significant in central Asia and central and eastern Europe and its promoting effect obviously. The reason is that China and south-east Asia region countries have signed a multilateral trade agreement, trade level is higher, so the number of people does not greatly affect the growth of exports. Another variable, distance, from the central Asia regional its regression coefficient is the biggest and significant, but in central and eastern Europe its absolute value minimum and not significant, reason is that Chinese commodities exported to central and eastern Europe are mostly independent from distance and their transportation developed, instead of goods exported to southeast Asia and central Asia in which the distance factor need more to be taken into account.

Among the above variables, the most obvious difference between regions is the trade facilitation index, in which the Central and Eastern European region has the highest level of trade facilitation, so the impact on China's exports is also the largest. The table shows that for every 1% increase in facilitation in south-East Asia, Central and Eastern Europe, China's exports to the region have increased by 1.66%, 2.14% and 5.06% accordingly. This result confirms once again that the level of trade facilitation in countries along the “Belt and Road”, both as a whole and in part, has the greatest impact on China's exports to them, so this factor should be given primary consideration in the study of relevant export policies.

### ***5.2.3. The impact of sub-factors on China's exports in trade facilitation***

In the Trade Facilitation Index system constructed in this paper, the five first-level indexes are: Regulatory environment, Infrastructure, Border administration, Business environment and Information and communications technology. In the case of limited

resources, to achieve optimal distribution requires a full understanding of the corresponding impact of different indicators, in order to be more practical and specific to the formulation and implementation of policy programmes. In this section, five indicators are brought into the trade gravity model respectively, and new index models are obtained on the basis of the 5.3 equation as follows:

$$\ln EXP_{jt} = e^{\alpha_0} + \alpha_1 \ln GDP_{jt} + \alpha_2 \ln POP_{jt} + \alpha_3 \ln DIS_{ij} + \alpha_4 \ln TAR_{jt} + \alpha_5 \ln RE_{jt} + \alpha_6 \ln POL_{jt} + \alpha_7 \ln BOR_{jt} + u_{ij} \quad (5.4- \text{Model 1})$$

$$\ln EXP_{jt} = e^{\alpha_0} + \alpha_1 \ln GDP_{jt} + \alpha_2 \ln POP_{jt} + \alpha_3 \ln DIS_{ij} + \alpha_4 \ln TAR_{jt} + \alpha_5 \ln IN_{jt} + \alpha_6 \ln POL_{jt} + \alpha_7 \ln BOR_{jt} + u_{ij} \quad (5.5- \text{Model 2})$$

$$\ln EXP_{jt} = e^{\alpha_0} + \alpha_1 \ln GDP_{jt} + \alpha_2 \ln POP_{jt} + \alpha_3 \ln DIS_{ij} + \alpha_4 \ln TAR_{jt} + \alpha_5 \ln BA_{jt} + \alpha_6 \ln POL_{jt} + \alpha_7 \ln BOR_{jt} \quad (5.6- \text{Model 3})$$

$$\ln EXP_{jt} = e^{\alpha_0} + \alpha_1 \ln GDP_{jt} + \alpha_2 \ln POP_{jt} + \alpha_3 \ln DIS_{ij} + \alpha_4 \ln TAR_{jt} + \alpha_5 \ln BE_{jt} + \alpha_6 \ln POL_{jt} + \alpha_7 \ln BOR_{jt} + u_{ij} \quad (5.7- \text{Model 4})$$

$$\ln EXP_{jt} = e^{\alpha_0} + \alpha_1 \ln GDP_{jt} + \alpha_2 \ln POP_{jt} + \alpha_3 \ln DIS_{ij} + \alpha_4 \ln TAR_{jt} + \alpha_5 \ln IC_{jt} + \alpha_6 \ln POL_{jt} + \alpha_7 \ln BOR_{jt} + u_{ij} \quad (5.8- \text{Model 5})$$

Using SPSS V25, the regression results are shown in the table.

Table IIX

## Sub-factorial Regression Results

Variables	Model 1		Model 2		Model 3		Model 4		Model 5	
	$\beta$	Sig	$\beta$	Sig	$\beta$	Sig	$\beta$	Sig	$\beta$	Sig
(Cons)	11.458	0.000	13.366	0.000	11.754	0.000	11.503	0.000	13.262	0.000
lnGDP	0.814	0.000	0.767	0.000	0.764	0.000	0.830	0.000	0.701	0.000
lnPOP	0.202	0.026	0.191	0.016	0.259	0.008	0.176	0.046	0.326	0.020
lnDIS	-1.601	0.000	-1.719	0.000	-1.632	0.000	-1.606	0.000	-1.768	0.000
lnTAR	-0.205	0.008	-0.147	0.049	-0.176	0.019	-0.195	0.011	-0.177	0.019
lnRE	1.034	0.107								
lnIN			1.829	0.005						
lnBA					1.459	0.024				
lnBE							0.957	0.201		
lnIC									1.622	0.077
POL	0.624	0.001	0.583	0.003	0.648	0.001	0.628	0.001	0.669	0.000



BOR	0.075	0.000	0.041	0.000	0.128	0.000	0.047	0.000	0.085	0.000
R-square	0.786		0.791		0.790		0.787		0.788	

From the above regression results, all the models fitting is around 7.9, which shows that the model can respond to the reality more correctly. Among them, the most influential indicator of China's exports is Infrastructure (*IN*), which, for every 1% increase, can bring 1.829% of China's trade export increments to countries along the "Belt and Road". The least influential is Business environment (*BE*), China increased its exports to the "Belt and Road" region by 0.96% when the indicator increased by 1%. In addition, Information and communications technology (*IC*) has a greater impact than Border administration, and Regulatory environment, indicating that in future trade, countries should more consider improving the competitiveness of telecommunications, network and other soft facilities to improve their own level of trade facilitation, so as to increase trade flows. The five specific trade facilitation indicators used in this paper rank the impact of China's trade exports to countries along the "Belt and Road": Infrastructure (*IN*) > Information and communications technology (*IC*) > Border administration (*BA*)> Regulatory environment (*RE*)> Business environment (*BE*).

## 6. Conclusion

The "Belt and Road" Initiative has broken the pattern of hegemonism in the world, opened a new path for the Eurasian continent, promoted economic integration and the improvement of global value chains, and gradually developed into a driving force for the world economy to move forward.

### *6.1 Main results of the research*

The thesis calculates the specific value of trade facilitation in 50 countries along the route, then collates all collected data into panel data and does the empirical analysis from three dimensions, which are, the overall level, the regional level and the factor level. All empirical results show that trade facilitation has a catalytic effect on China's exports. Finally, the complete conclusion are:

1. "Belt and Road" trade facilitation can promote the improvement of China's export trade. From the "Belt and Road" overall national distribution route, it can be seen that this road followed the ancient "Silk Road", becoming an important channel of circulation between Asia and Europe, so that the development from the beginning has a strong foundation. After the level of trade facilitation of countries along the route be improved, the exchanges between countries will be more smooth, the customs procedures and tariffs will be reduced, more foreign enterprises will be more friendly-welcome, and the circulation of trade will be greatly accelerated, especially in the context of globalization, the expansion of economic scale and the development of society will be significantly promoted.

2. The average level of trade facilitation in countries along the "Belt and Road" is still at a low level. Due to the difference of economic development, the level of trade facilitation varies from country to country, and most of them are at a low level, indicating that the economic level of most countries still has a lot of room for development. As mentioned earlier, this article divides the areas along the route into three major regions: East Asia, South Asia and Southeast Asia; Central Asia, West Asia, North Africa; Middle East and Europe. The impact of these three regional trade

facilitations on China's export trade in order: Central and Eastern Europe > East Asia, South Asia, Southeast Asia > Central Asia, West Asia, North Africa

3. In the trade facilitation index system, there is also a clear positive correlation between the indicators and the export trade between China and the countries along the “Belt and Road”. The index system constructed in this paper mainly includes five important indexes, namely Regulatory environment, Infrastructure, Border administration, Business environment and Information and communications technology. After an empirical analysis of these five indexes, it is found that the infrastructure level has the most significant impact on the trade of countries along the “Belt and road” route compared with other indicators. The second is the Information and communications technology and a more efficient and cleaner customs management will enable more investors or entrepreneurs to come to work together. The order of influence of the five indexes of trade facilitation of "Belt and Road" in the thesis on China's export trade is as follows: Infrastructure> Information and communications technology> Border administration > Regulatory environment> business environment.

## **6.2 Suggestion**

From the point of view of trade facilitation, the following suggestions can be made to promote trade between China and the regions along the route:

1. Strengthen infrastructure construction in countries along the “Belt and Road”. Whether a country's infrastructure is perfect is the basis for sustainable economic development, and it is one of the important indicators to improve the level of national trade facilitation. In the environment of improving infrastructure construction, the cost of trade between countries will be greatly reduced and communication will be more convenient. Therefore, all countries should invest in infrastructure construction, improve the overall transport development along the route, so that trade has a higher level of development. Because many countries along the route are developing countries which with poor infrastructure construction, lack of funds and advanced technology. In this process, China itself, while constantly improving its own infrastructure

construction, should actively promote the construction of some important trade routes, such as the Trans-Asian Railway and the new Eurasian Continental Bridge. At the same time, China should give full play to the important role of the AIIB and Silk Road funds, provides investment guarantees and advanced technologies, such as high-speed rail, to undeveloped countries along the route in order to achieve mutually beneficial and win-win goals.

2. Construct a standardized border management system, improve the efficiency of administrative approval and policy transparency along the route, simplify the administrative examination and approval process and import and export procedures and eliminate tariff barriers, so that the "Belt and Road" countries' custom environment can be optimized.

3. Accelerate the signing of trade agreements and the construction of free trade zones for countries along the "Belt and Road". Trade agreements would greatly reduce trade barriers between signatories, strengthen cooperation and exchanges between countries, simplify customs procedures, liberalize trade, promote trade facilitation and the development of international trade. The construction of free trade zones has eliminated most of the tariff and non-tariff barriers, promoted the free flow of factors of production such as goods and services, and achieved complementary advantages and promoted common development. Therefore, countries along the route should consider signing trade agreements that are beneficial to many parties and strengthening the construction of free trade zones, encouraging multilateral economic and trade activities and optimizing the allocation of resources.

4. Promote the sound development of trade facilitation according to local conditions. Due to the differences in development and resources, countries should adopt measures that are in line with their national advantages to improve the level of trade facilitation, not to follow others, but ignore their own conditions.

## 7. Reference

Balassa, Bela. 1928-1991. (1961). *The theory of economic integration*. Homewood, Ill.: R.D. Irwin.

Beckerman, W. (1956). Distance and the Pattern of Intra-European Trade. *The Review of Economics and Statistics* 38 (1): 31–40.

Coase, Ronald H. edited by Oliver E. Williamson, Sidney G. Winter. (1991). *The Nature of the firm: origins, evolution, and development*. New York: Oxford University Press.

Dennis, Allen (2006). The Impact of Regional Trade Agreements and Trade Facilitation in the Middle East and North Africa Region. *World Bank Policy Research Working Paper*, No. 3837.

Dennis, Allen & Shepherd, Ben. (2011). Trade Facilitation and Export Diversification. *The World Economy* 34(1), 101-122.

El-Agraa, A. M. (1988). *International Economic Integration*, 2nd Ed. Palgrave Macmillan UK.

Evdokia Moisé & Silvia Sorescu. (2013). Trade Facilitation Indicators: The Potential Impact of Trade Facilitation on Developing Countries' Trade. *OECD Trade Policy Papers*, pp144.

Feenstra, Robert C. & Ma, Hong. (2014). Trade Facilitation and the Extensive Margin of Exports. *Japanese Economic Review* 65(2), 158-177.

Isard, W., and M. J. Peck. (1954). Location Theory and International and Interregional Trade Theory. *The Quarterly Journal of Economics* 68 (1): 97–114.

Jia, Y., Zhang, et al. (2017). *Annual report on overseas Chinese study 2017, Blue Book of Overseas Chinese*. 1st ed. Social Sciences Academic Press (CHINA).

Kong Qingfeng & Dong Hongwei. (2015). Measurement and trade potential of trade facilitation in the "Belt and Road" countries. *International Trade Issues* (12), 158-168.

Linnemann, Hans. (1966). *An Econometric Study of International Trade Flows*. Amsterdam: NorthHolland.

Martinez-Zarzoso, Inma & Márquez-Ramos Laura (2008). The Effect of Trade Facilitation on Sectoral Trade. *The B.E. Journal of Economic Analysis & Policy*, De Gruyter, 8(1), 1-46.

Meade, J. E. (James Edward), 1907-1995. (1955). *Trade and Welfare*. London, New York: Oxford University Press.

National Information Centre (China). (2018). *Big Data Report on Trade Cooperation under the Belt and Road Initiative 2018*, Retrieved from: <https://www.pairault.fr/sinaf/doc/pairault-2018-08-31.pdf>

Portugal-Perez A. & Wilson J. S. (2012). Export Performance and Trade Facilitation Reform: Hard and Soft Infrastructure. *World Development* (Jan), 1295-1307.

Pöyhönen, P. (1963). A Tentative Model for the Volume of Trade between

Countries. *Weltwirtschaftliches Archiv* 90: 93–100.

Tinbergen, Jan. (1962). *Shaping the World Economy: Suggestions for an International Economic Policy*. New York: The Twentieth Century Fund.

Viner, Jacob, 1892-1970. (2014). *The Customs Union Issue*. New York :Oxford University Press.

Wilson, John S. and Mann, Catherine L. and Otsuki, Tsunehiro (2004). Assessing the Potential Benefit of Trade Facilitation: A Global Perspective. *World Bank Policy Research Working Paper*, No. 3224.

World Trade Organization. (1998). Trade Facilitation, Communication from Canada [Online]. Available from:  
[https://www.wto.org/english/tratop\\_e/tradfa\\_e/tradfa\\_overview1999\\_e.htm](https://www.wto.org/english/tratop_e/tradfa_e/tradfa_overview1999_e.htm)  
[Accessed: 5/6/2019]

Wu, Min. (2010). Trade Facilitation System in American Foreign Trade Zone and Its Enlightenment to China's Bonded Port Area. *Legal System and Society* (8).

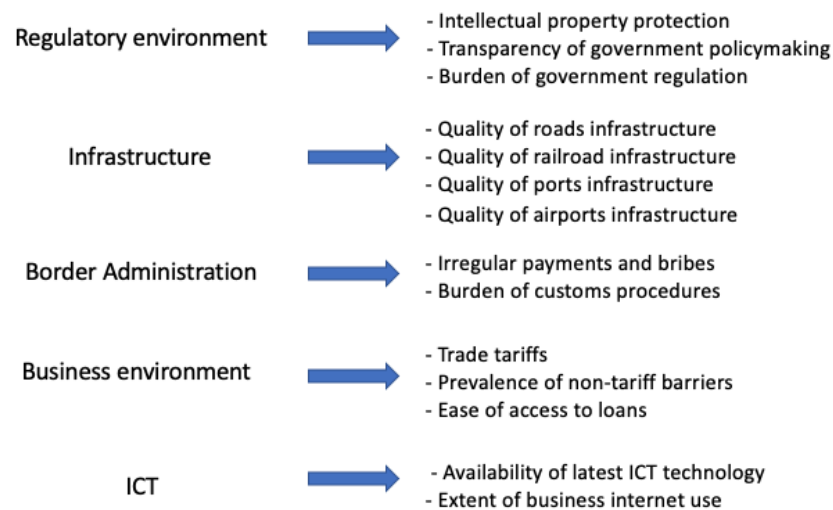
Zahid, W. (2015). *China's world-reshaping Belt and Road Initiative* [Online]. Available from: <https://walizahid.com/2015/10/chinas-world-reshaping-belt-and-road-initiative/> [Accessed: 10/5/2019].

Zhou, Jun. (2017). The Influence of Trade Facilitation on China's Export Efficiency: A Study Based on Stochastic Frontier Analysis. *Journal of Suzhou University (Philosophy and Social Sciences Edition)* 38(01): 108-113.

## 8. Appendix

### Appendix I

#### Categories of indicators



### Appendix II

#### Indicators code in *Global Competitiveness Report*

First-level indicator	Indicators	Code
Regulatory environment	Intellectual property protection	1.02
	Burden of government regulation	1.09
	Transparency of government policymaking	1.12
Physical infrastructure	Quality of roads infrastructure	2.02
	Quality of railroad infrastructure	2.03
	Quality of ports infrastructure	2.04
	Quality of airports infrastructure	2.05
Border administration:	Irreg. payments and bribes	1.05
	Burden of customs procedures	6.13
Business environment	Prevalence of non-tariff barriers	6.09
	Trade tariffs	6.10
	Ease of access to loans	8.04
Information and communications technology	Availability of latest ICT technology	9.01
	Extent of business internet use	9.04



## Appendix III

## Trade Facilitation Index of B&amp;R Countries in 2013-2017

<b>Country</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
Albania	0.56	0.57	0.59	0.63	0.64
Armenia	0.60	0.60	0.59	0.64	0.64
Azerbaijan	0.66	0.66	0.65	0.70	0.75
Bahrain	0.81	0.80	0.80	0.80	0.80
Bangladesh	0.49	0.50	0.48	0.51	0.54
Bhutan	0.55	0.57	0.57	0.59	0.62
Bosnia and Herzegovina	0.60	0.00	0.51	0.55	0.54
Bulgaria	0.61	0.62	0.61	0.62	0.61
Cambodia	0.55	0.51	0.50	0.53	0.52
China	0.68	0.70	0.69	0.71	0.72
Croatia	0.64	0.66	0.66	0.66	0.65
Czech Republic	0.69	0.70	0.73	0.75	0.74
Egypt	0.57	0.58	0.56	0.55	0.61
Estonia	0.76	0.81	0.81	0.84	0.81
Georgia	0.70	0.71	0.68	0.71	0.71
Greece	0.61	0.64	0.63	0.62	0.62
Hungary	0.66	0.67	0.65	0.67	0.68
India	0.61	0.61	0.63	0.68	0.68
Indonesia	0.63	0.64	0.62	0.63	0.65
Israel	0.73	0.72	0.73	0.80	0.81
Jordan	0.71	0.70	0.67	0.71	0.70
Kazakhstan	0.65	0.64	0.65	0.67	0.64
Kuwait	0.63	0.61	0.62	0.64	0.62

Kyrgyzstan	0.47	0.50	0.50	0.50	0.51
Laos	0.56	0.54	0.52	0.54	0.54
Latvia	0.71	0.73	0.73	0.72	0.70
Lebanon	0.56	0.54	0.56	0.57	0.56
Lithuania	0.72	0.72	0.71	0.74	0.72
Malaysia	0.80	0.87	0.86	0.82	0.82
Moldova	0.53	0.55	0.55	0.55	0.58
Mongolia	0.49	0.50	0.52	0.53	0.52
Montenegro	0.66	0.66	0.65	0.63	0.65
Nepal	0.47	0.47	0.46	0.48	0.49
Oman	0.80	0.76	0.71	0.72	0.71
Pakistan	0.55	0.54	0.54	0.54	0.56
Philippines	0.59	0.61	0.59	0.57	0.57
Poland	0.63	0.65	0.65	0.68	0.69
Qatar	0.90	0.87	0.88	0.86	0.85
Romania	0.55	0.60	0.61	0.60	0.61
Russia	0.58	0.61	0.61	0.62	0.64
Saudi Arabia	0.77	0.76	0.75	0.75	0.74
Singapore	0.97	0.91	0.97	0.98	0.98
Slovakia	0.67	0.68	0.68	0.69	0.68
Slovenia	0.70	0.70	0.69	0.72	0.71
Sri Lanka	0.61	0.62	0.63	0.64	0.60
Thailand	0.63	0.63	0.62	0.63	0.65
Turkey	0.67	0.67	0.67	0.68	0.68
Ukraine	0.52	0.56	0.55	0.55	0.56
United Arab Emirates	0.90	0.92	0.91	0.90	0.90
Vietnam	0.54	0.57	0.58	0.59	0.58